UNIT 1

Biology

Experiments and the Common Cold

Unit Description

Content: This course is designed to familiarize the student with concepts in biology and biological research.

Skills: Main Ideas and Supporting Details
- Understanding the main ideas and supporting details
- Finding main ideas: skimming
- Finding specific information: scanning
- Getting the gist: Understanding a speaker’s main ideas
- Listening for supporting details
- Writing a Paragraph

Unit Requirements

Readings: “Are we all scientists” (an excerpt from a biology textbook) “Hypotheses” (an excerpt from a biology textbook)

Lecture: “The Experimental Method”

Listening: “Common Myths about Colds” (a radio broadcast)

Integrated Writing Task: Writing a paragraph about a biological experiment

Assignments: www.MyConnectionsLab.com
**Previewing the Academic Content**

There is one thing common to all people around the world: we will all get many colds during our lives. The common cold is perhaps the most common illness in the world. So, why isn’t there any good medicine for it? How can scientists look for a way to help people with a cold?

In this unit, you will look at how biologists can use experiments to research illnesses. We will use the common cold as an example. You will also read and hear some information about the common cold.

1. Look at the ad. What do you think is wrong with the people in the picture?

2. Find the key words in the ad and guess their meaning from context. Then write each key word next to its definition. Discuss your answers with a partner.

   1. symptom——a problem with your body that shows you are ill
   2. remedy——make something better
   3. effective——something, such as a medicine, that makes you a little better
   4. works very well; successful
   5. having (an illness)

   Do you believe the ad? Why or why not?

3. Work with a partner. List as many symptoms of a cold and remedies as you can. Start with the symptoms and remedies in the ad on page 2.

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Remedies</th>
</tr>
</thead>
<tbody>
<tr>
<td>sore throat</td>
<td></td>
</tr>
</tbody>
</table>

4. Work in small groups. Discuss a time when you suffered from a cold. Answer the questions.

   1. What were your symptoms?
   2. What remedies did you try?
   3. Did the remedies relieve your symptoms?

**Previewing the Academic Skills Focus**

1. Work with a partner. Where do you expect the main idea to be? Check (√) all answers that you may think may apply.
   - in the title
   - at the beginning of the paragraph
   - in the middle of the paragraph
   - at the end of the paragraph
   - repeated throughout the paragraph

   The main idea is the writer or speaker’s most important idea or point. A supporting detail is a piece of information that gives more information about the main idea.

   It is very useful to understand main ideas and supporting details. In reading and listening, thinking about them can help you to understand more easily. You can make your writing clear by following conventions about main ideas and details, which you will learn in this unit.

   In writing, main ideas and supporting details usually go together in the same paragraph. A paragraph expresses or develops one main idea with supporting details. There is usually a blank line separating each paragraph, but sometimes the first word of a paragraph is indented instead—that is, the first line of the paragraph starts with some space before it.

   1. Work with a partner. Where do you expect the main idea to be? Check (√) all answers that you may think may apply.
      - in the title
      - at the beginning of the paragraph
      - in the middle of the paragraph
      - at the end of the paragraph
      - repeated throughout the paragraph

   conventions n. pl standard ways of doing things
2. Read the paragraph from a biology textbook. Then answer the questions. Compare your answers with a partner’s.

Are we all scientists?

Most people use a scientific process in their everyday lives to solve problems, such as curing an illness. If you catch a cold and ask your friends and family how to relieve the symptoms, you will hear the usual advice: Take a lot of vitamin C, use echinacea, keep warm, wear your hat and a warm coat outside, get plenty of sleep, and take two aspirin and visit the doctor in the morning. What should you do? Most people follow the advice that makes the most sense to them, and if they find that they still feel ill, they try another remedy. This is the kind of science that most of us use daily.

We see a problem, think of a few ways to solve it, and choose the way we think will work. If our first choice does not work, we move to our second choice and try again. Thus, science and everyday life are not really very different.

Before You Read

Work with a partner. Look at the flowchart on the next page. Then read the statements. Decide if they are true or false. Write T (true) or F (false). If the statement is false, explain why.

1. The hypothesis in this flowchart is “Taking vitamin C helps your body fight off colds.”

2. Before the experiment, the scientists are sure that the hypothesis is the correct explanation.
Global Reading

1. Work with a partner. Look at the strategies for skimming in the box. Compare them with the strategies for finding the main idea you checked on page 4. Tell your partner which strategies are the same.

**Finding Main Ideas: Skimming**

Skimming means reading quickly to understand the general meaning of a whole text. It can help you find the main ideas of paragraphs.

Here are some strategies to use when skimming:

**Do:**
- Read the title, headings, and subheadings of a text.
- Look out for **bold**, **italicized**, or **underlined** words.
- Read the first and last parts of each paragraph.

**Don’t:**
- Don’t use a dictionary.
- Don’t think about the meaning of difficult words. You can do that later.
- Don’t read every word.

It is a good idea to skim every text before you read it in detail. This will help you know what the text is about and where each main idea is.

2. Skim the excerpt from a biology textbook. What is the main idea? Then compare answers with a classmate’s.

1. The hypothesis is central to each experiment, so we need to know what hypotheses are and where they come from. As we saw earlier, our friends and family often give advice about avoiding colds (for example, the advice to wear a hat or take vitamin C). This kind of advice comes in part from what they know about how our bodies fight colds. Ideas about “how things work” are called hypotheses. Or, in other words, a hypothesis is an idea to explain one or more things we observe. All of us form hypotheses about why things happen. These come from our understanding of the world. When a mother tells her children to wear warm clothes, her advice comes from the following hypothesis: Getting cold makes it easier to catch a cold. Hypotheses in biology come from knowing how the body and other biological systems work, our experiences in similar situations, what we know about other scientific research, and logical thinking. Our creative minds also help.

2. A scientific hypothesis must be falsifiable. That is, you must be able to imagine a way to show that it is false, such as by giving an example showing that it is wrong. For instance, think about the hypothesis that you get more colds in cold weather. We could look at one group of people who spend time in cold temperatures and another group who stay in warm temperatures. If both groups get the same number of colds, the hypothesis might be false. So, this hypothesis is falsifiable. Of course, scientists do not show every hypothesis to be false—the important point is that proving them false is possible. This is why personal opinions, such as “It is wrong to cheat on exams,” are not scientific—each person has a different idea about right and wrong. It is not possible to falsify personal opinions.

3. Hypotheses must also be testable. This means it must be possible to check them by seeing or measuring things. Not all hypotheses are testable. For example, we cannot test hypotheses that need a supernatural force. If something is supernatural, it does not follow the laws of nature, and we cannot predict its behavior: we can’t measure anything about it.

4. An example of a common hypothesis about colds is that taking extra vitamin C prevents colds. This is very easy to believe, especially when you think about the following generally known facts:
   - Fruits and vegetables have a lot of vitamin C.
   - People who eat a lot of fruits and vegetables are often healthier than people who eat less of these foods.
   - Vitamin C is known to help with sore throats and nose irritation.

Given these facts, we can state the following falsifiable and testable hypothesis: Taking vitamin C lowers the chance of catching a cold. A 1970 book by the Nobel Prize winner Linus Pauling agreed with this hypothesis. Since then, however, repeated, careful tests have failed to support it. Also, people found that the results in Pauling’s book may have had other explanations. Today, most common cold researchers do not agree with this hypothesis.

3. Skim the text again. Write the main idea of each paragraph in your own words.

Paragraph 1: **What hypotheses are**
Paragraph 2:
Paragraph 3:
Paragraph 4:
Paragraph 5:

4. Read the questions. Using your responses in Exercise 3, write the number of the paragraph where you can find the answers to the questions. Do not look back at the reading.

   a. What is the definition of hypothesis?
   b. What does testable mean?
   c. What is one kind of hypothesis that cannot be tested?
   d. What does falsifiable mean?
   e. What is one kind of statement that cannot be falsified?
   f. Why is it often necessary to test a hypothesis more than once?
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Finding Specific Information: Scanning

Scanning can also help you find ideas quickly. It is different from skimming because you are looking for details, not a main idea.

Scanning means reading quickly to find specific information such as words, ideas, numbers, names, places, and dates. Specific information is often found in the supporting details. These could be definitions, examples, or explanations.

As with skimming, when scanning, do not read every word.

Here are some strategies to help you scan:

- Look for capital letters if you are looking for a place or a name.
- Look for numbers if you are looking for answers to questions about dates, times, etc.
- Find a key word in the question, or a word with the same meaning, and search for it.

3. Work with a partner. Look at each question in the chart. Think about what you will scan for to find the answers: capital letter, number, or key word. Check (√) all that apply. If you check key word, also underline the key word in the question. Do not look back at the reading.

<table>
<thead>
<tr>
<th>What will you scan for?</th>
<th>Capital Letter</th>
<th>Number</th>
<th>Key Word</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What is a hypothesis that a mother might use?</td>
<td>✅</td>
<td></td>
<td>✅</td>
</tr>
<tr>
<td>2. What kinds of food have a lot of vitamin C?</td>
<td></td>
<td>✅</td>
<td></td>
</tr>
<tr>
<td>3. Who wrote a book about vitamin C and colds?</td>
<td></td>
<td>✅</td>
<td></td>
</tr>
<tr>
<td>4. When did he write it?</td>
<td></td>
<td></td>
<td>✅</td>
</tr>
<tr>
<td>5. What famous prize did he win?</td>
<td></td>
<td></td>
<td>✅</td>
</tr>
<tr>
<td>6. Do scientists agree with the book now?</td>
<td></td>
<td></td>
<td>✅</td>
</tr>
</tbody>
</table>

4. Scan the reading on pages 6–7 and write the answers to the questions in the chart. Then compare your answers with a classmate.

1. ____________________________
2. ____________________________
3. ____________________________
4. ____________________________
5. ____________________________
6. ____________________________

Focused Reading

1. Read paragraphs 2 and 3 on pages 6–7. Find examples of the three elements listed. Underline them. Then compare your answers with a partner.

- two definitions
- three examples
- an explanation (not just a description)

2. Work with your partner to complete the chart. Which expressions introduce a definition, an example, or an explanation?

Type of Supporting Idea | Phrases Introducing Supporting Ideas
---|---
Definition | This means
Example | 
Explanation | 

5. Answer the questions in Exercise 4 by reading in detail only the paragraphs you chose. Then compare your answers with a partner.

a. ____________________________
b. ____________________________
c. ____________________________
d. ____________________________
e. ____________________________
f. ____________________________

5. Answer the questions in Exercise 4 by reading in detail only the paragraphs you chose. Then compare your answers with a partner.